Wildfire Hazard Potential for the United States (270-m), version 2020

Metadata:

- Identification_Information
- Data_Quality_Information
- Spatial_Data_Organization_Information
- Spatial_Reference_Information
- Entity_and_Attribute_Information
- Distribution_Information
- Metadata_Reference_Information

Identification_Information:
 Citation:
 Citation_Information:
 Originator: Dillon, Gregory K.
 Originator: Gilbertson-Day, Julie W.
 Publication_Date: 2020
 Title:
 Wildfire Hazard Potential for the United States (270-m), version 2020
 Edition: 3rd
 Geospatial_Data_Presentation_Form: raster digital data
 Publication_Information:
 Publication_Place: Fort Collins, CO
 Publisher: Forest Service Research Data Archive
 Other_Citation_Details:
 This dataset is the classified WHP for the conterminous United States (CONUS). It has been classified into discrete hazard potential classes based on percentile breaks in the continuous WHP index.
 Online_Linkage: https://doi.org/10.2737/RDS-2015-0047-3
 Description:
 Abstract:
 This dataset is the classified wildfire hazard potential (WHP) for the conterminous United States (CONUS). WHP is an index that quantifies the relative potential for wildfire that may be difficult to control, used as a measure to help prioritize where fuel treatments may be needed. In this dataset, we have classified continuous WHP values into very low, low, moderate, high, and very high WHP classes, with national wildland fire and fuels planning objectives in mind.

 This 2020 version of WHP was created as part of the Wildfire Risk to Communities project (https://wildfirerisk.org) and this dataset is a 270-m resolution companion to the WHP published in Scott et al. (2020). Vegetation and wildland fuels data from LANDFIRE 2014 (version 1.4.0) form the foundation for this version of the WHP. As

such, the data presented here reflect landscape conditions as of the end of 2014. National wildfire hazard datasets of annual burn probability and fire intensity were generated from the LANDFIRE 2014 data by the USDA Forest Service, Rocky Mountain Research Station (Short et al. 2020) using the large fire simulation system (FSim). We also used LANDFIRE 2014 vegetation and fuels data directly in the WHP mapping process, as well as point locations of fire occurrence ca. 1992 - 2015 (Short 2017). With these datasets as inputs, we produced an index of WHP for all of the conterminous United States at 270-m resolution. We present the final WHP map in two forms: 1) continuous integer values, and 2) five WHP classes of very low, low, moderate, high, and very high. On its own, WHP is not an explicit map of wildfire threat or risk, but when paired with spatial data depicting highly valued resources and assets such as structures or powerlines, it can approximate relative wildfire risk to those specific resources and assets. WHP is also not a forecast or wildfire outlook for any particular season, as it does not include any information on current or forecasted weather or fuel moisture conditions. It is instead intended for long-term strategic fuels management.

Purpose:
Federal wildfire managers often want to know, over large landscapes, where wildfires are likely to occur and how intense they may be. To meet this need we developed a map that we call wildfire hazard potential (WHP) - a raster geospatial product that can help to inform evaluations of wildfire risk or prioritization of fuels management needs across very large spatial scales (millions of acres). Our specific objective with the WHP map was to depict the relative potential for wildfire that would be difficult for suppression resources to contain.

Supplemental_Information:
This data publication is a third edition. Previous versions of this publication prior to 2014 were known as Wildland Fire Potential (WFP). These new data represent an update to all previous versions of WHP or WFP published by the USDA Forest Service. Previous versions have only covered the conterminous United States. This most recent version includes data for Hawaii and Alaska for the first time, as well as the conterminous United States, and data are provided as both continuous and classified in a single publication.

To check for the latest version of the WHP geospatial data and map graphics, as well as documentation on the mapping process, see: https://www.firelab.org/project/wildfire-hazard-potential.

Details about the Wildfire Hazard Potential mapping process can be found in Dillon et al. (2015). Steps described in this paper about weighting for crown fire potential were dropped in the 2018 and 2020 versions due to changes to the FSim modeling products used as the primary inputs to WHP mapping.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20150101
Currentness_Reference:
Ground condition
Status:

Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Description_of_Geographic_Extent:
Bounding_Coordinates:
West_Bounding_Coordinate: -127.97220
East_Bounding_Coordinate: -65.26221
North_Bounding_Coordinate: 51.63280
South_Bounding_Coordinate: 22.76568
Keywords:
Theme:
Theme_Keyword_Thesaurus: ISO 19115 Topic Categories
Theme_Keyword: environment
Theme_Keyword: geoscientificInformation
Theme_Keyword: society
Theme_Keyword: structure
Theme:
Theme_Keyword_Thesaurus: National Research & Development Taxonomy
Theme_Keyword: Ecology, Ecosystems, & Environment
Theme_Keyword: Fire
Theme_Keyword: Fire detection
Theme_Keyword: Fire ecology
Theme_Keyword: Fire effects on environment
Theme_Keyword: Fire suppression, pre-suppression
Theme_Keyword: Prescribed fire
Theme_Keyword: Environment and People
Theme_Keyword: Forest management
Theme_Keyword: Landscape management
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: burn probability
Theme_Keyword: hazard
Theme_Keyword: fuels management
Theme_Keyword: fire suppression
Theme_Keyword: fire likelihood
Theme_Keyword: fire planning
Theme_Keyword: risk assessment
Theme_Keyword: wildfire hazard potential
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: conterminous United States
Place_Keyword: United States
Place_Keyword: CONUS
Access_Constraints: None
Use_Constraints:

These data were collected using funding from the U.S. Government and can be used without additional permissions or fees. If you use these data in a publication, presentation, or other research product please use the following citation:

Dillon, Gregory K; Gilbertson-Day, Julie W. 2020. Wildfire Hazard Potential for the United States, version 2020 (270m). 3rd Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2015-0047-3.

The data presented here are the product of modeling, and as such carry an inherent degree of error and uncertainty. Users are strongly encouraged to read and fully comprehend the metadata and other available documentation prior to data use. No warranty is made by the Originator as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the Originator. These datasets are intended to provide nationally-consistent information for the purpose of comparing relative wildfire risk among communities nationally or within a state or county. Data included here are not intended to replace locally-calibrated state, regional, or local risk assessments where they exist. It is the responsibility of the user to be familiar with the value, assumptions, and limitations of these national data publications. Managers and planners must evaluate these data according to the scale and requirements specific to their needs. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

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Contact_Electronic_Mail_Address: `greg.dillon@usda.gov`
Data_Set_Credit:
Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily completed by Pyrologix, LLC under contract with the USDA Forest Service, Fire Modeling Institute.
Cross_Reference:
Citation_Information:
Originator: Scott, Joe H.

Originator: Gilbertson-Day, Julie W.
Originator: Moran, Christopher
Originator: Dillon, Gregory K.
Originator: Short, Karen C.
Originator: Vogler, Kevin C.
Publication_Date: 2020
Title:
Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: Forest Service Research Data Archive
Online_Linkage: https://doi.org/10.2737/RDS-2020-0016
Cross_Reference:
Citation_Information:
Originator: Short, Karen C.
Originator: Finney, Mark A.
Originator: Vogler, Kevin C.
Originator: Scott, Joe H.
Originator: Gilbertson-Day, Julie W.
Originator: Grenfell, Isaac C.
Publication_Date: 2020
Title:
Spatial dataset of probabilistic wildfire risk components for the United States (270m)
Edition: 2nd
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: Forest Service Research Data Archive
Online_Linkage: https://doi.org/10.2737/RDS-2016-0034-2
Cross_Reference:
Citation_Information:
Originator: Short, Karen C.
Publication_Date: 2017
Title:
Spatial wildfire occurrence data for the United States, 1992-2015 [FPA_FOD_20170508]
Edition: 4th
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: Forest Service Research Data Archive
Online_Linkage: https://doi.org/10.2737/RDS-2013-0009.4
Cross_Reference:
Citation_Information:
Originator: Dillon, Gregory K.

Originator: Menakis, James
Originator: Fay, Frank
Publication_Date: 2015
Title:
Wildland fire potential: A tool for assessing wildfire risk and fuels management needs
Geospatial_Data_Presentation_Form: conference proceedings
Other_Citation_Details:
p. 60-76
Online_Linkage: https://www.treesearch.fs.fed.us/pubs/49429
Larger_Work_Citation:
Citation_Information:
Originator: Keane, Robert E.
Originator: Jolly, Matt
Originator: Parsons, Russell
Originator: Riley, Karin
Publication_Date: 2015
Title:
Proceedings of the large wildland fires conference
Geospatial_Data_Presentation_Form: conference proceedings
Series_Information:
Series_Name: Proceedings
Issue_Identification: Proc. RMRS-P-73
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station
Other_Citation_Details:
May 19-23, 2014; Missoula, MT; 345 p.
Online_Linkage: https://www.treesearch.fs.fed.us/pubs/49166
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Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
The data described here are derived from wildfire simulation modeling, and their exact accuracy cannot be measured. They are intended to be relative measures of wildfire risk for planning purposes. The FSim datasets of burn probability and intensity used as primary inputs were objectively evaluated and calibrated against historic wildfire occurrence statistics within 136 distinct regions of contemporary wildfire activity (pyromes) across the United States (Short, Grenfell, Riley, and Vogler 2020). See Short et al. (2020) for a more detailed description of FSim calibration. Some LANDFIRE fuels and vegetation data used as inputs have also been evaluated for efficacy and calibrated to meet the objectives of LANDFIRE. More information can be found at: https://www.landfire.gov/lf_evaluation.php.

Short, Karen C.; Grenfell, Isaac C.; Riley, Karin L.; Vogler, Kevin C. 2020. Pyromes of the conterminous United States. Fort Collins, CO: Forest Service Research Data Archive.

https://doi.org/10.2737/RDS-2020-0020

Short, Karen C.; Finney, Mark A.; Vogler, Kevin C.; Scott, Joe H.; Gilbertson-Day, Julie W.; Grenfell, Isaac C. 2020. Spatial datasets of probabilistic wildfire risk components for the United States (270m). 2nd Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2016-0034-2

Quantitative_Attribute_Accuracy_Assessment:
Attribute_Accuracy_Value: Unknown
Attribute_Accuracy_Explanation:
Quantitative accuracy cannot be evaluated.
Logical_Consistency_Report:
Values for non-burnable lands (6) and open water (7) were taken directly from a national mosaic of the FBFM40 layer in the landscape files used in national FSim modeling. The source for these landscape files was LANDFIRE 1.4.0 (2014) data resampled to 270-m resolution.
Completeness_Report:
All pixels that are part of the land and water of the United States have valid non-zero values.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: Short, Karen C.
Originator: Finney, Mark A.
Originator: Vogler, Kevin C.
Originator: Scott, Joe H.
Originator: Gilbertson-Day, Julie W.
Originator: Grenfell, Isaac C.
Publication_Date: 2020
Title:
Spatial dataset of probabilistic wildfire risk components for the United States (270m)
Edition: 2nd
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: Forest Service Research Data Archive
Online_Linkage: https://doi.org/10.2737/RDS-2016-0034-2
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20150101
Source_Currentness_Reference:
Ground Condition
Source_Citation_Abbreviation:
FSim BP and FLPs (FLP1, FLP2, FLP3, FLP4, FLP5, FLP6)

Source_Contribution:
Burn probability (BP) and/or flame-length probabilities (FLPs) modeled with FSim were primary spatial inputs to datasets presented here. BP provided information about the overall probability of any 270-meter pixel experiencing a large fire of any intensity. FLPs provided information about the conditional probability of particular fire intensity levels (i.e., likelihood of a particular intensity level, given a fire) for every 270-meter pixel.
Source_Information:
Source_Citation:
Citation_Information:
Originator: LANDFIRE, U.S. Department of the Interior, Geological Survey
Publication_Date: 2017
Title:
LANDFIRE 1.4.0 40 Scott and Burgan Fire Behavior Fuel Models layer
Edition: 1.4.0
Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details:
Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p. https://doi.org/10.2737/rmrs-gtr-153
Online_Linkage: https://landfire.cr.usgs.gov/viewer/
Online_Linkage: https://www.landfire.gov/fuel.php
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20150101
Source_Currentness_Reference:
Ground Condition
Source_Citation_Abbreviation:
LANDFIRE FBFM40
Source_Contribution:
The LANDFIRE Fire Behavior Fuel Models layer was a primary input to the FSim BP and FIL datasets.
Source_Information:
Source_Citation:
Citation_Information:
Originator: Short, Karen C.
Publication_Date: 2017
Title:
Spatial wildfire occurrence data for the United States, 1992-2015 [FPA_FOD_20170508]
Edition: 4th
Geospatial_Data_Presentation_Form: vector digital data
Publication_Information:
Publication_Place: Fort Collins, CO
Publisher: Forest Service Research Data Archive

Other_Citation_Details:
Spatial wildfire occurrence Additional information is available in: Short, Karen C. 2014.
A spatial database of wildfires in the United States, 1992-2011. Earth Systems Science
Data 6:1-27. https://doi.org/10.5194/essd-6-1-2014
Online_Linkage: https://doi.org/10.2737/RDS-2013-0009.4
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19920101
Ending_Date: 20151231
Source_Currentness_Reference:
Observed
Source_Citation_Abbreviation:
FPA FOD
Source_Contribution:
The FPA point fire occurrence database (FPA FOD) was used in the process of creating
the burn probability (BP) and fire intensity level (FIL) rasters.
Source_Information:
Source_Citation:
Citation_Information:
Originator: LANDFIRE, U.S. Department of the Interior, Geological Survey
Publication_Date: 2017
Title:
LANDFIRE 1.4.0 Existing Vegetation Type layer
Edition: 1.4.0
Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details:
Rollins, Matthew G. 2009. LANDFIRE: a nationally consistent vegetation, wildland fire,
and fuel assessment. International Journal of Wildland Fire 18:235-249.
https://doi.org/10.1071/wf08088
Online_Linkage: https://www.landfire.gov/vegetation.php
Online_Linkage: https://landfire.cr.usgs.gov/viewer/
Type_of_Source_Media: Online
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20150101
Source_Currentness_Reference:
Ground Condition
Source_Citation_Abbreviation:
LANDFIRE EVT
Source_Contribution:
The LANDFIRE EVT layer was used to spatially apply resistance to control weights to
create the final WHP.
Process_Step:

Process_Description:
1. Using the nationally-available 270-m FSim BP and FLP data, multiply BP by each FLP to get the actual probabilities of fire occurrence in each flame length class.
Source_Used_Citation_Abbreviation:
FSim BP and FLPs
Process_Date: 201912
Process_Step:
Process_Description:
2. Weight the probabilities in each flame length class by the potential hazard they represent and sum them to derive a measure of large wildfire potential. Weights used were: FLP1 and FLP2 - 1; FLP3 and FLP4 - 8; FLP5 - 25; FLP6 - 75.
Process_Date: 201912
Process_Step:
Process_Description:
3. Create a separate surface of small wildfire potential based on ignition locations for fires smaller than 300 acres (generally not accounted for in FSim).
Source_Used_Citation_Abbreviation:
FPA FOD
Process_Date: 201912
Process_Step:
Process_Description:
4. Integrate the large wildfire potential created in process steps 1-2 with the small wildfire potential created in process step 3. This was done by weighting each according to its relative contribution to total wildfire potential, then adding the weighted values.
Process_Date: 201912
Process_Step:
Process_Description:
5. Apply a set of resistance to control weights based on fireline construction rates in different fuel types.
Source_Used_Citation_Abbreviation:
LANDFIRE FBFM40
LANDFIRE EVT
Process_Date: 201912
Process_Step:
Process_Description:
6. Convert WHP values to integers by multiplying by 10,000 and rounding to the nearest whole number (preserves four decimal places of precision).
Process_Date: 201912
Process_Step:
Process_Description:
7. Evaluate the statistical distribution of WHP values and classify them into five classes: very low, low, moderate, high, very high. Add in non-burnable and water from LANDFIRE FMFM40 layer to produce final classified version of WHP.
Source_Used_Citation_Abbreviation:
LANDFIRE FBFM40
Process_Date: 20200702

Spatial_Data_Organization_Information:
    Direct_Spatial_Reference_Method: Raster
    Raster_Object_Information:
    Raster_Object_Type: Pixel
    Row_Count: 10803
    Column_Count: 17132
Spatial_Reference_Information:
    Horizontal_Coordinate_System_Definition:
    Planar:
    Map_Projection:
    Map_Projection_Name: Albers Conical Equal Area
    Albers_Conical_Equal_Area:
    Standard_Parallel: 29.5
    Standard_Parallel: 45.5
    Longitude_of_Central_Meridian: -96
    Latitude_of_Projection_Origin: 23
    False_Easting: 0
    False_Northing: 0
    Planar_Coordinate_Information:
    Planar_Coordinate_Encoding_Method: Coordinate Pair
    Coordinate_Representation:
    Abscissa_Resolution: 270
    Ordinate_Resolution: 270
    Planar_Distance_Units: Meters
    Geodetic_Model:
    Horizontal_Datum_Name: North American Datum of 1983
    Ellipsoid_Name: Geodetic Reference System 80
    Semi-major_Axis: 6378137.0000
    Denominator_of_Flattening_Ratio: 298.25722210
Entity_and_Attribute_Information:
    Overview_Description:
    Entity_and_Attribute_Overview:
    This dataset represents wildlfire hazard potential (WHP) in six classes: 1) very low, 2) low, 3) moderate, 4) high, and 5) very high. In addition, non-burnable lands (6) and open water (7) are represented as separate classes.
    Entity_and_Attribute_Detail_Citation:
    Dillon, Gregory K.; Menakis, James; Fay, Frank. 2015. Wildland fire potential: A tool for assessing wildfire risk and fuels management needs. In: Keane, Robert E.; Jolly, Matt; Parsons, Russell; Riley, Karin. Proceedings of the large wildland fires conference; May 19-23, 2014; Missoula, MT. Proc. RMRS-P-73. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 60-76. https://www.fs.usda.gov/treesearch/pubs/49429

Distribution_Information:
      Distributor:
      Contact_Information:
      Contact_Organization_Primary:
      Contact_Organization: USDA Forest Service, Research and Development
      Contact_Position: Research Data Archivist
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      Address_Type: mailing and physical
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      City: Fort Collins
      State_or_Province: CO
      Postal_Code: 80526
      Country: USA
      Contact_Voice_Telephone: see Contact Instructions
      Contact_Instructions: This contact information was current as of November 2020. For current information see Contact Us page on: https://doi.org/10.2737/RDS.
      Resource_Description: RDS-2015-0047-3
      Distribution_Liability:
Metadata documents have been reviewed for accuracy and completeness. Unless otherwise stated, all data and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. However, neither the author, the Archive, nor any part of the federal government can assure the reliability or suitability of these data for a particular purpose. The act of distribution shall not constitute any such warranty, and no responsibility is assumed for a user's application of these data or related materials.

The metadata, data, or related materials may be updated without notification. If a user believes errors are present in the metadata, data or related materials, please use the information in (1) Identification Information: Point of Contact, (2) Metadata Reference: Metadata Contact, or (3) Distribution Information: Distributor to notify the author or the Archive of the issues.
      Standard_Order_Process:
      Digital_Form:
      Digital_Transfer_Information:
      Format_Name: TIFF
      Format_Version_Number: 2020
      Format_Information_Content:
8 Bit unsigned integer; LZW compression
      File_Decompression_Technique: Files zipped using 7-Zip version 19.00
      Digital_Transfer_Option:
      Online_Option:
      Computer_Contact_Information:
      Network_Address:
      Network_Resource_Name: https://doi.org/10.2737/RDS-2015-0047-3
      Digital_Form:
      Digital_Transfer_Information:

Format_Name: GDB
Format_Version_Number: 2020
Format_Information_Content:
8 Bit unsigned integer; LZ77 compression
File_Decompression_Technique: Files zipped with 7-Zip version 19.00
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: https://doi.org/10.2737/RDS-2015-0047-3
Fees: None
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Metadata_Reference_Information:
    Metadata_Date: 20201118
    Metadata_Contact:
    Contact_Information:
    Contact_Person_Primary:
    Contact_Person: Gregory K. Dillon
    Contact_Organization: USDA Forest Service, Fire Modeling Institute (FMI)
    Contact_Position: Spatial Fire Analyst
    Contact_Address:
    Address_Type: mailing and physical
    Address: Missoula Fire Sciences Laboratory
    Address: 5775 US Hwy 10 W
    City: Missoula
    State_or_Province: MT
    Postal_Code: 59808
    Country: USA
    Contact_Voice_Telephone: 406-829-6783
    Contact_Electronic_Mail_Address: greg.dillon@usda.gov
    Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
    Metadata_Standard_Version: FGDC-STD-001.1-1999
Back to Top